

REMARKS

Status of the Claims

Claims 1-33 are presently pending, new claims 30-33 being presented in this Reply. Of the indicated claims 1-33, claims 1-15 are nonelected, and have been withdrawn from consideration; claims 16-29 are elected, and new claims 30-33 also are considered to be included with the elected claims. Nonelected claim 1, and elected claims 16, 24, and 30, are independent.

Amendments to the Claims

Claim 16 has been amended to specify that the recited amorphous silica, surface treated with at least one organoaminosilane, is in aggregate form. This amendment is supported in the specification, inter alia, at paragraph [047].

Claim 16 has additionally been amended to correct a punctuation error. The semicolon that previously appeared at the end of claim 16 has been replaced with a period.

Claim 26 also has been amended to correct a punctuation error. The semicolon that should have appeared at the end of subsubparagraph (a)iii), but was inadvertently omitted, has been added. The punctuation of this subsubparagraph is accordingly consistent that of the prior subsubparagraphs.

Requirement for New Corrected Drawings

As required by the Examiner, new drawings are submitted concurrently with this written Reply. These drawings are provided with a separate Transmittal of New Corrected Drawings. In accordance with the Examiner's instructions, the new drawings include corrections to the character of lines, numbers, and letters, and to the numbers, letters, and reference characters, as specified in items 10 and 12, respectively, of the Notice of Draftsperson's Patent Drawing Review.

Rejection over U.S. Patent No. 6,579,929 (COLE et al.)

1. Claims 16-20

Claims 16-20 were rejected under 35 U.S.C. § 102(e) as being anticipated by COLE et al. Claim 16, as amended, recites amorphous silica in aggregate form; because all of claims 17-20 ultimately depend from claim 16, in fact all of claims 16-20 recite amorphous silica in aggregate form. However, COLE et al. discloses stabilized silica, and teaches that stabilized silica cannot be in the form of aggregates.

In this regard, the title of COLE et al. is "Stabilized Silica, and Method of Making and Using Same". At column 2, line 43 through column 3, line 14, COLE et al. refers to the advantages of employing stabilized non-agglomerated silica, and to the invention as providing a process for preparing surface-stabilized,

non-agglomerated silica dispersed within a polymer. At column 4, lines 17-19, COLE et al. states that by the practice of the invention as taught therein, the surface of the non-agglomerated silica is stabilized. And at column 3, lines 41-43, COLE et al. defines "stabilized" as being substantially unable to form an aggregate or an agglomerate via normal physical means. (emphasis added).

Particularly in discussing the substantial inability of stabilized silica to form an aggregate, COLE et al. distinguishes between the stabilized and the aggregate forms of silica, and emphasizes that the former (stabilized silica) is not the latter (aggregate silica). COLE et al. further emphasizes that the silica taught therein is in the stabilized, not aggregate, form.

Accordingly, with claims 16-20 now being directed to amorphous silica in aggregate form, by virtue of this distinction in and of itself, COLE et al. fails to anticipate these claims alone. For this reason alone, claims 16-20 are patentable over COLE et al.

And particularly regarding claim 20, this claim specifies hexamethyldisilazane as the treating organoaminosilane. Claim 20 therefore is directed to a composition comprising fluoroelastomer and hexamethyldisilazane treated aggregate amorphous silica.

Compositions 1 and 2, disclosed in the Application at paragraphs [0167] and [0168], respectively, are compositions of the invention. Each of Composition 1 and Composition 2 comprises, inter alia, a fluoroelastomer and hexamethyldisilazane treated fumed silica (Application, paragraphs [0167] and [0168], respectively). The fluoroelastomer is Viton® A (Application, paragraph [0157]), and the hexamethyldisilazane treated fumed silica is Cab-O-Sil® TS-530 (Application, paragraph [0159]). With fumed silica being a type of amorphous silica (Application, paragraph [046]), Composition 1 and Composition 2 accordingly both comprise, in addition to the indicated fluoroelastomer, amorphous silica with hexamethyldisilazane as the treating organoaminosilane - corresponding to the recitation of claim 20.

Filed concurrently with this Reply is the inventors' Declaration under 37 C.F.R. § 1.131, including accompanying photocopies of laboratory records. This Declaration establishes that Composition 1 was reduced to practice during the period of December 8 and 9, 1999 (Declaration, paragraphs 3-6), and that Composition 2 was reduced to practice on or before November 6, 1999 (Declaration, paragraphs 7-10).

Both Composition 1 and Composition 2 were reduced to practice before the COLE et al. January 19, 2000 filing date. Accordingly,

each of Composition 1 and Composition 2, by itself, is sufficient to establish invention, of the subject matter of claim 20, prior to the effective date of COLE et al. So for these additional reasons, claim 20 is patentable over COLE et al.

2. Claims 30 and 33

Claim 30 is directed to a composition comprising fluoroelastomer, and amorphous silica treated with at least one from a group of listed silazanes, one of which is hexamethyldisilazane. Claim 33, depending from claim 30, specifies hexamethyldisilazane as the at least one treating silane.

As previously established, Compositions 1 and 2 in the Application both are compositions of the invention, both comprise fluoroelastomer and hexamethyldisilazane treated amorphous silica, and both were reduced to practice before the effective date of COLE et al.

Of the silazanes recited in claim 30, the only one taught in COLE et al. is hexamethyldisilazane. And as has been demonstrated, both of Compositions 1 and 2 separately establish that the composition of Applicants' invention utilizing hexamethyldisilazane was reduced to practice before the effective date of COLE et al. So each of Compositions 1 and 2 by itself establishes that claim 30 is patentable over COLE et al.

Corresponding to claim 20, claim 33 also recites fluoroelastomer and treated silica, and also specifies hexamethyldisilazane as the treating agent. So for the same reasons as apply with respect to claim 20, each of Compositions 1 and 2 by itself likewise establishes that claim 33 is patentable over COLE et al.

3. Claims 31 and 32

Claims 31 and 32 each depend from claim 30; accordingly, like claim 30, each is directed to a composition comprising fluoroelastomer, and amorphous silica treated with at least one from a group of listed silazanes. Claim 31 additionally recites, along with the indicated fluoroelastomer and treated silica, the presence of curative. Claim 32 additionally recites, along with the indicated fluoroelastomer and treated silica, the presence of solvent.

Like the above noted Composition 1 and Composition 2, the coating composition of Example 3 in the Application, and the coating composition of Example 5 in the Application, also are compositions of the invention. Preparation of the coating composition of Example 3 is disclosed in the Application at paragraphs [0188], [0184], [0177] and [0178]; preparation of the coating composition of Example 5 is disclosed in the Application at paragraphs [0192] and [0193].

The coating composition of Example 3 comprises Composition 1 (Application, paragraphs [0188] and [0184]), and the coating composition of Example 5 comprises Composition 2 (Application, paragraphs [0192] and [0193]). The coating compositions of Examples 3 and 5 both further comprise Viton® Curative No. 50 (Application, paragraphs [0178] and [0193]) and MEK (Application, paragraphs [0177] and [0192]). As previously noted, Compositions 1 and 2 both comprise a fluoroelastomer and hexamethyldisilazane treated amorphous silica, while Viton® Curative No. 50 is a curative (Application, paragraphs [085]-[088]), and MEK is methyl ethyl ketone, which is a solvent (Application, paragraph [0107]).

Accordingly, the coating compositions of Example 3 and Example 5 both comprise fluoroelastomer, hexamethyldisilazane treated amorphous silica, and curative - corresponding to the claim 31 composition comprising fluoroelastomer, silazane treated amorphous silica, and curative. From another aspect, the coating compositions of Example 3 and Example 5 both comprise fluoroelastomer, hexamethyldisilazane treated amorphous silica, and solvent - corresponding to the claim 32 composition comprising fluoroelastomer, silazane treated amorphous silica, and solvent.

The previously discussed Declaration under 37 C.F.R. § 1.131 establishes that the coating composition of Example 3 was reduced to practice on January 18, 2000 (Declaration, paragraphs 11-15), and that the coating composition of Example 5 was reduced to practice on or before November 6, 1999 (Declaration, paragraphs 16-19). Therefore, both the Example 3 and Example 4 coating compositions were reduced to practice before the COLE et al. effective date of January 19, 2000.

Just as is the case with claim 30, of the silazanes recited in claims 31 and 32, the only one taught in COLE et al. is hexamethyldisilazane. So for the same reasons as apply with respect to claim 30, each of Compositions 1 and 2 by itself likewise establishes that claims 31 and 32 are patentable over COLE et al.

Rejection over U.S. Patent No. 5,102,763 (WINNIK et al.)

1. Claims 16-20

Claims 16-20 were rejected under 35 U.S.C. § 102(b) as being anticipated by WINNIK et al. Claims 16-20, both before and after the amendments presented in this Reply, have recited a fluoroelastomer. However, though WINNIK et al. does refer to a fluoropolymer, this patent does not disclose or suggest a fluoroelastomer.

In this regard, the Examiner states that the WINNIK et al. patent discloses a fluoropolymer as the carrier particles as taught in U.S. Patents Nos. 3,526,533, 3,849,186, and 3,942,979. The portions of WINNIK et al. that the Examiner cites as providing this teaching are column 18, lines 23-27; column 25, lines 40-45; column 26, lines 28-33; and column 27, lines 54-57.

It is respectfully noted that the Examiner is mistaken in asserting that WINNIK et al. teaches a fluoropolymer as being carrier particles. Rather - at the column 18, lines 23-27, which is the first of the four WINNIK et al. portions cited by the Examiner on this issue - the WINNIK et al. patent teaches that the carrier particles may be coated with fluoropolymers, and further states that suitable coating materials, including fluoropolymers, are disclosed in the three above-indicated U.S. patents.

However, none of these U.S. Patents Nos. 3,526,533, 3,849,186, and 3,942,979 discloses or suggests a fluoroelastomer. Neither of U.S. Patents Nos. 3,526,533 or 3,849,186 mentions any kind of fluoropolymer. U.S. Patent No.3,942,979 refers to polytetrafluoroethylene, polyvinyl fluoride, polyvinylidene fluoride, and polychlorotrifluoroethylene (column 10, lines 45-47), but these are all plastics, and not fluoroelastomers.

And the remaining three portions of WINNIK et al. cited here by the Examiner - i.e., column 25, lines 40-45; column 26, lines

28-33; and column 27, lines 54-57 - all refer to FPC 401, a copolymer derived from fluorovinyl and chlorovinyl monomers, and available from Firestone Plastics. This too is a plastic, and not a fluoroelastomer.

So with claims 16-20 reciting a fluoroelastomer, and WINNIK et al. failing to disclose or suggest a fluoroelastomer, for this reason alone WINNIK does not anticipate these claims.

2. Claims 30-33

Claims 30-33 also are directed to a fluoroelastomer. So for the same reasons as stated with respect to claims 16-20, WINNIK also does not anticipate claims 30-33.

Rejection of claims 21-28 under 35 U.S.C. § 103(a) as being unpatentable over COLE et al. or WINNIK et al., each individually in view of U.S. Patent No. 4,912,171 (GROOTAERT et al.) or U.S. Patent No. 5,824,416 (CHEN et al.)

1. Claims 21-23

a. COLE et al. in view of GROOTAERT et al. or CHEN et al.

Claims 21-23 all ultimately depend from amended claim 16, which - as discussed - recites amorphous silica in aggregate form. Therefore, claims 21-23 likewise recite amorphous silica in aggregate form.

The deficiency of COLE et al., with regard to amorphous silica in aggregate form, is previously discussed. This deficiency is not cured by GROOTAERT et al. or by CHEN et al.;

neither of these patents discloses or suggests the use of amorphous silica in aggregate form, or indeed of silica in any form.

Accordingly, COLE et al. and GROOTAERT et al., even taken together, fail to disclose or suggest every recited feature, of any of claims 21-23. For this reason alone, claims 21-23 are patentable over the combined teachings of COLE et al. and GROOTAERT et al.

Likewise, COLE et al. and CHEN et al., even taken together, fail to disclose or suggest every recited feature, of any of claims 21-23. Correspondingly, for this reason alone, claims 21-23 are patentable over the combined teachings of COLE et al. and CHEN et al.

It is further noted that, to support a rejection based on the combined teachings of COLE et al. and GROOTAERT et al., or a rejection based on the combined teachings of COLE et al. and CHEN et al., there must be motivation to combine the teachings of the indicated references. The Examiner has not shown the requisite motivation for combining the teachings of COLE et al. and GROOTAERT et al., or for combining the teachings of COLE et al. and CHEN et al.

Accordingly, for this additional reason, claims 21-23 are patentable over the combined teachings of COLE et al. and

GROOTAERT et al. Also for this additional reason, claims 21-23 are patentable over the combined teachings of COLE et al. and CHEN et al.

b. WINNIK et al. in view of GROOTAERT et al. or CHEN et al.

WINNIK et al. teaches, as is well known in the art, that toner can be fused to a substrate, such as paper, to form an image on the substrate (column 1, lines 34-43). It is further well known in the art, as confirmed by WINNIK et al., that toner used for this purpose can be employed as part of a developer composition comprising both toner particles and carrier particles; WINNIK et al. additionally teaches a particular developer composition that includes toner incorporating organoaminosilane treated amorphous silica, and carrier coated with fluoropolymer (column 4, lines 30-35; column 5, line 35 through column 6, line 44; column 18, lines 3-6 and 23-26).

As has been demonstrated, WINNIK does not disclose or suggest that the indicated fluoropolymer can be a fluoroelastomer. As has also been shown, the only fluoropolymers which are taught by WINNIK are plastics. Yet further, WINNIK et al. does not otherwise disclose or suggest the use of a fluoroelastomer.

GROOTAERT et al. does disclose a fluoroelastomer. However, GROOTAERT et al. teaches the use of this fluoroelastomer for

automotive shaft seals, for gaskets and O-rings used to contain fluids under pressure in hydraulic systems, and for components of chemical processing reactors (column 11, lines 12-18). These fluoroelastomer uses certainly have no relation to the WINNIK et al. use of fluoropolymers as developer composition carrier coatings.

Accordingly, neither WINNIK et al. nor GROOTAERT et al. provides disclosure or suggestion to use the GROOTAERT et al. fluoroelastomer as a fluoropolymer coating for the WINNIK et al. carrier, or for otherwise combining the teachings of WINNIK et al. and GROOTAERT et al. By virtue of this lack of motivation alone, claims 21-23 are patentable over the teachings of WINNIK et al. and GROOTAERT et al.

CHEN et al. also discloses a fluoroelastomer. In this regard - with respect to forming toner images on substrates - CHEN et al. teaches, as is well known in the art, using a fuser roller having a fluoroelastomer surface layer, for contacting toner in fusing it to the substrate (column 1, lines 15-18, lines 23-26, and lines 39-51). CHEN et al. further teaches a particular fluoroelastomer for this purpose (column 2, line 30 through column 3, line 14).

However, using a fluoroelastomer for the surface layer of a fuser roller is completely unrelated to using a fluoropolymer as the carrier coating in a developer composition. Corresponding to

the foregoing discussion as to WINNIK et al. and GROOTAERT et al., both WINNIK et al. and CHEN et al. fail to provide any disclosure or suggestion to use the CHEN et al. fluoroelastomer as a fluoropolymer coating for the WINNIK et al. carrier. Here also, lack of motivation by itself requires the conclusion that claims 21-23 are patentable over the teachings of WINNIK et al. and CHEN et al.

2. Claims 24-28

The process of the invention as recited in claims 24-28 is for preparing a coating formulation that incorporates fluoroelastomer, as well as amorphous silica surface treated with organoaminosilane. This process addresses a problem that is particular to compositions including both the fluoroelastomer and silica.

As discussed in the Application, silica incorporated in fluoroelastomer compositions causes crepe hardening therein, and this crepe hardening produces gel defects in coating formulations made from these compositions (paragraphs [014] and [015]; paragraphs [075] and [076]; paragraph [0108]). The gel defects will appear in the coatings resulting from the formulations, and correspondingly in surface layers formed by these coatings (Application, paragraph [0110]).

However, in accordance with the process of the invention, the formulation that results from this process is provided at least essentially free of gel defects, if, in the process:

- the fluoroelastomer and treated silica are dispersed throughout the formulation solvent;

- with the fluoroelastomer and silica accordingly being dispersed in the solvent, a bisphenol curing system, comprising bisphenol crosslinking agent and accelerator, is also thusly dispersed; and

- dispersion of the crosslinker and accelerator, together with dispersion of the fluoroelastomer and silica, is continued at least until the formulation obtained from this process has no gels, or substantially or essentially no gels. (Application, paragraphs [0112] and [0113]).

With regard to the foregoing, claims 24-29 all recite a process which is for preparing a coating composition comprising fluoroelastomer and organoaminosilane treated amorphous silica, and which combats gel defects in the composition. All of these process claims 24-29 specify that, in the process for preparing the coating composition, a solution or dispersion is provided, and that a certain condition - i.e., dispersion of crosslinking agent, accelerator, fluoroelastomer, and silica throughout the solvent -

is maintained at least until a particular objective is reached.
This recited objective is the essential absence of gels.

In addition to the foregoing process condition set forth in claim 24, the following claims 25-29 recite yet further process conditions, with each claim depending from the one immediately preceding. For instance, claim 25 provides that at least the solvent, fluoroelastomer, and treated silica are mixed under high shear, and claim 26 specifies that, after the high shear mixing, mixing without high shear is conducted; claims 27-29 of course all add further features.

As to the references that the Examiner applies against claims 24-28 - i.e., COLE et al., WINNIK et al., GROOTAERT et al., and CHEN et al. - he cites none as pertaining to any manner of crepe hardening and gel defects, let alone to the occurrence of these faults particularly in fluoroelastomer and silica compositions. In this regard, he does not cite any of COLE et al., WINNIK et al., GROOTAERT et al., or CHEN et al., alone or in combination, as disclosing or suggesting a gel combating process for preparing a fluoroelastomer and silica coating, nor does he even refer to any of these references as disclosing or suggesting any of the particular process features as discussed above. And in fact, these references do not disclose or suggest the process of the invention, as recited in claims 24-28. Claims 24-28 accordingly

are patentable over the references cited by the Examiner against these claims.

Rejection of claims 29 under 35 U.S.C. § 103(a) as being unpatentable over COLE et al. or WINNIK et al., each individually in view of GROOTAERT et al. or CHEN et al., and further in view of U.S. Patent No. 6,485,835 (HEEKS et al.) or U.S. Patent No. 6,261,688 (KAPLAN et al.)

1. Claim 29 recites a Process for Preparing a Coating Formulation. Coating Formulations That are Produced by This Process Are Cured to Become Surface Layers.

As discussed, claim 29, like claims 24-28, is directed to the process of the invention for preparing a coating formulation. Specifically, claim 29 recites the inclusion of at least one α,ω difunctional polydiorganosiloxane in the process.

The coating formulation obtained from this preparation process is cured to become the surface layer of a surface treating member - such as a fuser member - for a toner fusing system employed in electrostatographic reproduction (Application, paragraphs [03]-[05], [017], [028] and [0123]-[0128]).

2. Preparing a Coating Formulation Is Undeniably Different from, and Indisputably Unrelated to, Using a Release Agent in a Toner Fusing System.

In the operation of the foregoing toner fusing system - as is well known in the art - the fuser member, by means of its surface layer, contacts toner residing on a substrate, such as paper, to fuse the toner to the substrate (Application, paragraph [0148], and Fig. 1, showing toner images 22, on substrate 21, contacted by

fusing surface layer 13 of fuser member 10; CHEN et al., column 1, lines 15-18, lines 23-26, and lines 39-51).

Also as is well known in the art, during the fusing process a release agent can be applied to the fuser member surface, to inhibit the offset of toner from the substrate to the fuser member (Application, paragraphs [06], [08], [0144], and [0147], and Fig. 1, showing release agent 34, from sump 29, transferred to fusing surface layer 13 of fuser member 10).

From the foregoing, it can readily be seen that using a polydiorganosiloxane, to prepare a coating formulation that is cured to make a surface layer, is completely different from, and absolutely unrelated to, applying a release agent to an existing surface layer, as part of the fusing process, for the purpose of preventing toner offset.

3. The Examiner's Cited Teachings from KAPLAN et al. and HEEKS et al. Pertain to Using a Release Agent in a Toner Fusing System, and Therefore Do Not Render A Process for Preparing a Coating Formulation Unpatentable.

The Examiner contends that the teachings of KAPLAN et al. (column 18, lines 46-50) and HEEKS et al. (column 19, lines 23-24), cited against claim 29, pertain to the inclusion of specified compounds in fluoroelastomeric compositions. However, it is respectfully submitted that this contention is erroneous; rather, these KAPLAN et al. and HEEKS et al. teachings, each of which

refers to the chemical structure of particular fuser oils, both pertain to release agents applied to fuser members in the toner fusing process. And, as has been conclusively demonstrated, using a compound, to make a surface layer that ultimately will be employed in the toner fusing process, has nothing to do with applying a release agent to a surface layer, as part of the toner fusing process.

Accordingly, neither HEEKS et al. nor KAPLAN et al. discloses or suggests including at least one α,ω difunctional polydiorgano-siloxane in the recited process for preparing a coating formulation. For this reason alone, claim 29 is patentable over COLE et al. or WINNIK et al., each individually in view of GROOTAERT et al. or CHEN et al., and further in view of HEEKS et al. or KAPLAN et al.

Moreover, claim 29 incorporates the limitations of claims 24-28, and neither KAPLAN et al. nor HEEKS et al. cures the previously discussed deficiencies - i.e., of COLE et al., WINNIK et al., GROOTAERT et al., and CHEN et al. - with respect to these claims. So for this additional reason, claim 29 is patentable over COLE et al. or WINNIK et al., each individually in view of GROOTAERT et al. or CHEN et al., and further in view of HEEKS et al. or KAPLAN et al.

CONCLUSION

It is respectfully submitted that, for the reasons as stated, the claims presently pending in this Application are patentable over the art of record, and the Application is otherwise in condition for allowance.

Withdrawal of the restriction requirement, withdrawal of the objections and rejections, and allowance of all pending claims, is respectfully requested. It is further respectfully requested that this allowance be set forth in the next Official Action for the Application.

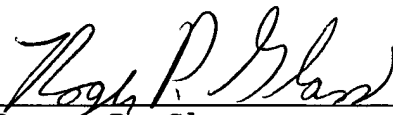
Favorable action is respectfully solicited.

The Commissioner is authorized to charge any additional amount or fee required for acceptance of this reply as timely and complete to Deposit Account No. 50-1381.

Should the Examiner have any questions or comments regarding this matter, the undersigned may be contacted at the below-listed telephone number.

November 17, 2003
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Respectfully submitted,
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